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PRACTICAL TIPS FOR SPRAYING FACT SHEET

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NORTHERN, SOUTHERN AND WESTERN REGIONS

PRACTICAL TIPS TO REDUCE SPRAY DRIFT

KEY POINTS

- Make the most of favourable weather conditions, especially wind speed.
- Use the coarsest spray quality that will provide efficacy.
- Maintain boom height to achieve double overlap, but no higher.
- Try to minimise your travel speed.
- Utilise unsprayed areas and downwind vegetative buffers.

Spray during favourable weather conditions

Wind speed is critical

Air movement is needed to ensure that mixing occurs in the air. This helps to deposit airborne droplets. Mixing of the air happens when air movement is more turbulent, especially while the sun is heating the ground.

Day-time spraying – once the sun is up – when the wind speed is consistently above 4 to 5 kilometres per hour is usually safer than night-time spraying – between sunset and sunrise.

It has been suggested that night-time wind speeds should be above 11km/h to ensure some mixing occurs and to minimise the likelihood of a surface temperature inversion.

Wind speeds should be below 15 to 20km/h as measured at the site of application, depending on the label instructions.

Temperature and humidity (Delta T)

Delta T values indicate evaporative potential. High values can reduce droplet survival in the air and at the target.

Airborne droplets will rapidly decrease in size when the delta T value of the air exceeds 8 to 10.

When using a coarse spray quality or larger, also check the Delta T value at the target and avoid values above 10 to 12.

Low Delta T values (below 2) encourage droplet survival, which can increase the risk of spray drift.

Using the coarsest droplets that will provide efficacy will reduce the airborne fraction and increase droplet survival times.

Spray quality

Spray quality is a useful guide for determining the amount of chemical that could remain in the air after the spray has been released from the nozzle.

Coarser spray qualities reduce risk by reducing the airborne fraction.

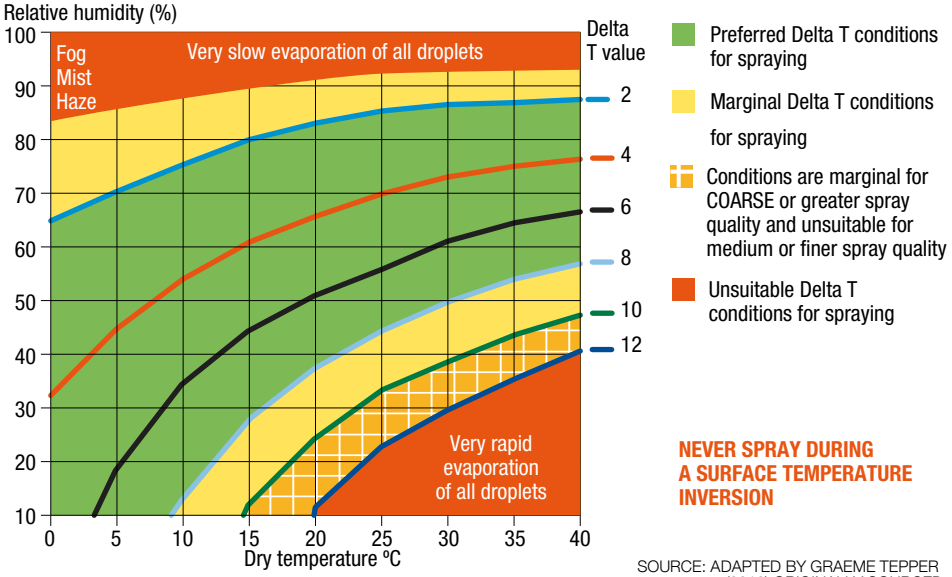
Each time spray quality is changed to a larger classification (for example from medium to coarse), the amount of spray that exists as droplets capable of moving off target is halved.

Table 1 Fine spray deposition

Spray quality	The percentage of the spray output below 200 microns *
Fine (F)	40 to 50 per cent
Medium (M)	Less than 20 per cent
Coarse (C)	Less than 10 per cent
Very coarse (VC)	Less than 5 per cent
Extremely coarse (XC)	Less than 2 to 3 per cent

* According to ASABE standards.

FIGURE 1 The relationship of Delta T to relative humidity and temperature. A common spray guideline is to spray when Delta T is between 2 and 8; with caution below 2 or above 10



For the estimation of evaporation potential of the aqueous component of pesticide droplets the rate can be considered to be constant for a given Delta T.

SOURCE: ADAPTED BY GRAEME TEPPER (2012) ORIGINALLY SOURCED FROM NUFARM'S SPRAYWISE DECISIONS CHART (2012)

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PHOTO: EVAN COLLIS

Increasing boom height increases drift risk.

Boom height and speed

Nozzle height

Nozzle height should not be more than that required for double overlap at the top of the stubble or crop/weeds canopy (whichever is taller).

Consider using auto-height control, suitable touch-down wheels, or lower travel speeds to improve boom stability and to assist with minimising boom height.

Increasing height from 50 centimetres above the target to 70cm can increase the amount of chemical left in the air by up to 4 times.

Increasing height from 50cm to 1 metre can increase the airborne fraction by up to 10 times.

Travel speed

Increasing travel speeds will increase the amount of chemical left in the air. This can be due to detrainment at the nozzle (escape of small droplets from the pattern) or aerodynamic affects around the sprayer itself.

Increased travel speeds interact with increased wind speeds.

A Canadian study, conducted by Dr Thomas Wolf of the Saskatoon Research Centre, showed that high travel speeds combined with higher wind speeds (20km/h) almost doubled the amount of chemical left in the air when compared to low travel speeds (8km/h).

In the same study, when the wind speed was around 7 to 8km/h (under day-time conditions), the drift potential was similar at high or low travel speeds.

Other studies have shown that at night the airborne fraction can be up to 5 times greater than that occurring during the day at similar wind speeds.

As a guide it is suggested applicators avoid travel speeds above 16 to 18km/h unless there is excellent boom height control and equipment is set up to minimise airborne droplets (that is, coarse spray quality or larger).

Vegetative and unsprayed buffers

Leaving an unsprayed, downwind buffer between the treated area and sensitive areas can reduce the risk of damage from direct droplet deposit and may be a requirement on some labels.

Porous vegetative buffers, such as *Casuarina* species, that are more than 1.5 times the release height can further reduce that risk, when the air flow is turbulent. However, under surface temperature inversion conditions vegetation may simply divert airborne droplets, rather than filtering them out.

FREQUENTLY ASKED QUESTIONS

When is the best time to spray?

Usually during daylight hours, when the wind speed is consistently above 4 to 5km/h, predictable in direction, and is less than the permissible wind speed on the product label. Delta T value should be above 2 and the target plants or weeds not stressed.

If considering spraying at night, be aware many product labels state: “DO NOT spray under surface temperature inversion conditions”, which have been shown to occur most nights.

USEFUL RESOURCES

Surface temperature inversions and spraying Fact Sheet
www.grdc.com.au/GRDC-FS-SprayInversions

Ground Cover Direct
Free Phone: 1800 11 00 44
ground-cover-direct@canprint.com.au

Graeme Tepper, ‘Weather essentials for pesticide application’, GRDC
www.grdc.com.au/GRDC-Booklet-WeatherEssentials

MORE INFORMATION

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